

**Notice of Allowability**

Application No.

10/688,070

Examiner

Cindy Nguyen

Applicant(s)

DOUCETTE ET AL.

Art Unit

2161

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 06/19/07.
2. ☒ The allowed claim(s) is/are 1, 4-7, 10, 12, 14, 17, 18, 27-30 (renumber as 1-14).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |  |   |
|--|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application                     |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),<br>Paper No./Mail Date _____    | 7. <input type="checkbox"/> Examiner's Amendment/Comment                              |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|  | 9. <input type="checkbox"/> Other _____   |

### DETAILED ACTION

This is response to communication filed 06/19/07.

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jordan Becker on 07/31/07.

Claims amended as following:

1. (Currently amended) A method for improved space allocation in a file system having a set of storage blocks in a mass storage system, including

maintaining an active map of said storage blocks not available for writing data;  
generating, for each one of a plurality of regions of said storage blocks in said mass storage system, a value indicative of a number of storage blocks available for writing data in said region, based on said active map and at least one snapshot of the file system, each said region including a plurality of storage blocks in the active file system and a plurality of storage blocks in each of said at least one snapshot, each said at least one snapshot of the file system having a copy of said active map as said active map existed at a previous time; and

~~selecting, based on said values, at least one of said plurality of regions for writing~~  
data

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setting an allocation threshold based on a number of storage blocks available for writing data in the file system;

comparing the values to the allocation threshold;

selecting one of said plurality of regions for which the corresponding value has a specified relationship to the allocation threshold; and

writing the data into the selected one of said plurality of regions.

2-3. (Canceled)

4. (Currently amended) A method as in claim 31, wherein said step of setting comprises setting the threshold based on a percentage of the number of storage blocks available for writing data in the file system.

5. (Currently amended) A method as in claim 34, wherein said step of selecting comprises selecting a first of said one of the plurality of regions with ~~because the corresponding value exceeding corresponding to said region exceeds~~ the threshold.

6. (Previously presented) A method as in claim 1, wherein each said value is a binary number.

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7. (Previously presented) A method as in claim 6, wherein each said value is stored in a data block containing one or more binary numbers each corresponding to a unique region.

8-9. (Canceled)

10. (Currently amended) A method as in claim 31, wherein said selecting ~~comprises~~ further comprising linearly searching said plurality of regions to select a first region with the corresponding value exceeding the threshold.

11. (Canceled)

12. (Currently amended) A method as in claim 31, further ~~including~~ comprising selecting an additional region when said data requires more blocks than available in the selected ~~at least one of~~ said plurality of regions.

13. (Canceled)

14. (Currently amended) An apparatus for improved data space allocation including a file system that has a set of storage blocks and a mass storage system; wherein  
said file system maintains an active map of storage blocks of the set of storage blocks that are not available to write data;

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said file system generates, for each one of a plurality of equal regions of said storage blocks in said mass storage system, a value that corresponds to said region and is indicative of a number of storage blocks available to write data in said region, based on said active map and at least one snapshot of the file system, each said region including a plurality of storage blocks in the active file system and a plurality of storage blocks in each of said at least one snapshot, each said at least one snapshot of the file system having a copy of said active map as said active map existed at a previous time; and

~~said file system selects for writing data at least one of said plurality of regions in response to said values~~

said file system sets an allocation threshold based on a number of storage blocks available for writing data in the file system;

said file system compares the values to the allocation threshold;

said file system selects one of said plurality of regions for which the corresponding value has a specified relationship to the allocation threshold; and

said file system writes the data into the selected one of said plurality of regions.

15-16. (Canceled)

17. (Currently amended) ~~And~~ An apparatus as in claim 4514, wherein said file system sets the allocation threshold based on a percentage of the number of storage blocks available to write data in the file system.

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18. (Currently amended) ~~And~~ An apparatus as in claim ~~15~~14, wherein said file system selects ~~a first of said~~ one of the plurality of regions with ~~because~~ the corresponding value ~~exceeding~~ corresponding to said region exceeds the threshold, by using a linear search of said plurality of equal regions.

19-26. (Canceled)

27 (Currently amended) An article of manufacture comprising a memory with program code stored therein, ~~the program code~~which, when executed by a processor, directs the processor to cause a file system to perform the steps of any one of claims ~~[[1-7,]]~~ 1, 4, 5, 7, 10, or 12.

28. (Previously presented) A method as in claim 1, wherein said plurality of regions are equal in size.

29. (Previously presented) A method as in claim 1, wherein each of said plurality of regions of said storage blocks comprises a plurality of storage blocks, at least some of which store user data.

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30. (Previously presented) An apparatus as in claim 14, wherein each of said plurality of regions of said storage blocks comprises a plurality of storage blocks, at least some of which store user data.

***Allowable Subject Matter***

Claims 1, 4-7, 10, 12, 14, 17, 18, 27-30 are allowed in light of the applicant arguments and in light of the prior art made of record.

The following is an examiner's statement of reasons for allowance: the prior art of record and that encountered while searching for the claimed invention fails to anticipate and/or suggest: a method for improved space allocation in a file system having a set of storage blocks in a mass storage system including: setting an allocation threshold based on a number of storage blocks available for writing data in the file system, comparing the values to the allocation threshold, selecting one of said plurality of regions for which the corresponding value has a specified relationship to the allocation threshold and writing the data into the selected one of said plurality of regions as recited in claims 1 and 14.

The dependent claims 4-7, 10, 12, 17, 18 and 27-30, being further limiting to the independent claims 1 and 14 definite and fully enable by the specification are also allowed.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

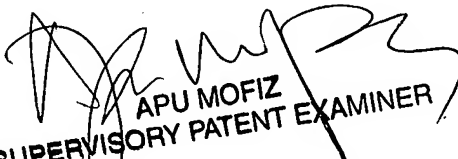
#### Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cindy Nguyen whose telephone number is 571-272-4025. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Apu Mofiz can be reached on 571-272-4080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cindy Nguyen



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SUPERVISORY PATENT EXAMINER